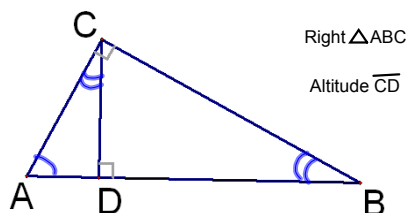


7-3 Use Similar Right Triangles
(Geometric Mean)

What are the similar triangles?

$$\triangle ABC \sim \triangle ACD \sim \triangle CBD$$

$$\frac{AB}{AC} = \frac{BC}{CD} = \frac{AC}{AD}$$

$$\frac{AC}{CB} = \frac{CD}{BD} = \frac{AD}{CD}$$

$$\frac{AB}{CB} = \frac{BC}{BD} = \frac{AC}{DC}$$

Theorem 7-5--If the altitude is drawn to the hypotenuse of a right triangle, then the 2 triangles formed are similar to each other and the original triangle.

Geometric Mean (review)

$$\frac{r}{s} = \frac{s}{t} \quad s \text{ is the geometric mean}$$

Find the geometric mean between 3 and 8.

$$\frac{3}{x} = \frac{x}{8} \quad x^2 = 3 \cdot 8 \quad x = 2\sqrt{6}$$

Find the geometric mean between 9 and 14.

$$\frac{9}{x} = \frac{x}{14} \quad x^2 = 9 \cdot 14 \quad x = 3\sqrt{14}$$

Ratios from the triangle. Do you see any g. means?

$$\frac{AB}{AC} = \frac{AC}{AD}$$

$$\frac{AB}{BC} = \frac{BC}{BD}$$

$$\frac{BD}{CD} = \frac{CD}{DA}$$

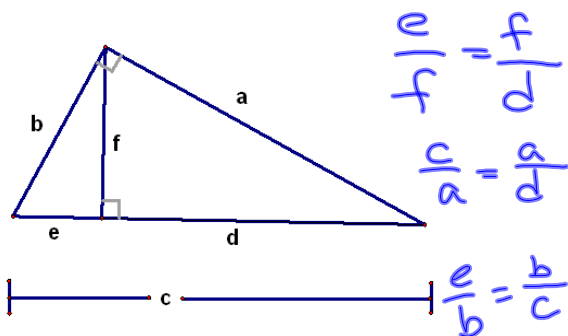
leg, hypo., altitude

Theorem 7.6--Geometric Mean (altitude)

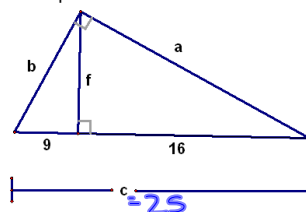
Theorem---In a right triangle, ...the altitude is the geometric mean b/w segments of hypotenuse

Theorem 7.7--Geometric Mean (leg) Theorem---In a

right triangle,....each leg is the geometric mean b/w the hypotenuse and the segment of the hypotenuse that is adjacent to the leg.



Example 1

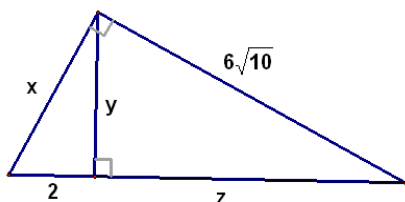


Find
 $a = 20$
 $b = 15$
 $c = 25$
 $f = 12$

$$\frac{9}{f} = \frac{f}{16} \quad \frac{b}{a} = \frac{a}{25} \quad \frac{25}{b} = \frac{b}{9}$$

$$f = 12 \quad a = 20 \quad b = 15$$

ex. 2



$$\frac{2}{y} = \frac{y}{z+2} \quad \frac{z}{6\sqrt{10}} = \frac{6\sqrt{10}}{z+2}$$

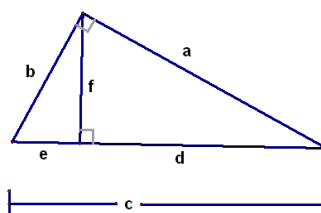
$$x = 2\sqrt{10} \quad y = 6 \quad z = 18$$

$$z^2 + 2z = 360$$

$$z^2 + 2z - 360 = 0$$

$$(z+20)(z-18) = 0$$

$$z = -20 \quad z = 18$$



$$\frac{e}{b} = \frac{b}{c} \quad \frac{c}{a} = \frac{a}{d}$$

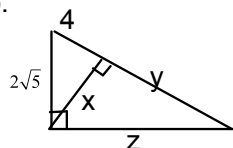
$$b^2 = ec \quad a^2 = cd$$

$$a^2 + b^2 = cd + ec$$

$$c(d+e)$$

$$a^2 + b^2 = c^2$$

Do:



HW

p454

13-18, 21-23, 27

Keep answers in
simplified radical form.